

## Reactive Power and Harmonic Compensation

# StacoVAR<sup>®</sup> Features and Functions

Low voltage systems

StacoVAR equipment is designed and built to bring you the highest quality product at the lowest price possible. Our personal attention to the design and assembly of each unit gives you powerful benefits and a long list of standard and optional features that is unmatched in the industry.

### Automatic Power Factor Correction

**FEATURE:** Enclosure is rigid design, bolted construction with floor; economical in size.

**Function:** Accommodates multiple trays of kVAR; provides for modularity and enclosure expansion; allows for maximum kVAR in a small footprint; compatible with match & line to switchgear and motor control centers.

**FEATURE:** Enclosure uses a powder coat finish painted light gray, includes 4-point latch, mechanism and locking handle.

**Function:** Many years of superior protection and durability of fabricated metal, hinges/hardware are rust resistant for long life; optimum personnel safety.

**FEATURE:** Designed for convection or forced air ventilation.

**Function:** Allows for proper heat dissipation of components, extending life and maintaining the integrity of operation.

**FEATURE:** Enclosure offers front, rear and both side access.

**Function:** Provides several alternatives for service personnel while still allowing equipment to be located near or adjacent to a wall.

**FEATURE:** Top or bottom rear entry feed.

**Function:** Open access for easier installation of equipment.

*Single unit enclosure (480 VAC) accommodates up to 800 kVAR or 600 kVAR with a molded-case circuit breaker. When equipped with reactors, 400 and 300 kVAR (C/B) are available. Single unit enclosure's approximate dimensions are 83"H x 32"W x 24"D (with lifting eyes removed).*



**FEATURE:** Complete assembly is UL and c-UL listed. All components are UL listed/recognized or CSA approved.

**Function:** Assures safety requirements met by third party agency for complete assembly, not just individual components.

**FEATURE:** Design of internal trays includes all major components.

**Function:** One design with electrical and mechanical devices mounted and wired simplifies equipment construction and testing continuity; allows for modularity.

**FEATURE:** Design of internal tray accommodates multiple kvar ratings and allows for tray expansion. Standard "step" sizes are 25 kVAR, 50 kVAR, 100 kVAR and 200 kVAR (480 VAC example).

**Function:** Standardization of trays provides greater user selection to match switched kVAR needs today and in the future.

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Tray Assembly, side view

**FEATURE:** Multiple trays offer large total kVAR rating in one enclosure.

**Function:** Reduces cost and floor space.

**FEATURE:** Bottom of trays include a unique venting structure; trays are galvanized steel.

**Function:** Tray ventilation assures proper convection flow, reducing potential for hot spots within enclosure; improves overall cooling; galvanized steel for added durability and resistance to environmental elements.

**FEATURE:** Clearance between trays allows for heat dissipation and easy replacement.

**Function:** Little heat build-up allows the cooler operating capacitors to have a longer life; should a capacitor need replacement (damage from lightning or other electrical fault), the unit can be easily replaced.

**FEATURE:** Tray to tray wiring is simple and neatly configured. Bus bar is center mounted, bus links can be easily removed/added should front servicing be required, or another tray added.

**Function:** Helps service personnel locate connections, reduces electrical stress, and makes trouble-shooting or tray equipment additions easier.

**FEATURE:** All trays use a grommet where "through wiring points" are located.

**Function:** Grommet protects wiring from any sharp metal edges.



Internal view of enclosure, 600 kVAR with molded-case circuit breaker.

**FEATURE:** Control wiring with numbered terminations and quick connect plugs, when multiple enclosures are used.

**Function:** Simplifies servicing.

**FEATURE:** Bus bar is electrical grade copper, Brite® Nickel Plated and braced for 50k amps.

**Function:** Provides for best conductivity versus aluminum, or non-plated type material; maintains mechanical integrity should a major electrical fault occur. Bus bar is not insulated, to help with visual safety. Bus bar size is ½" x 2 ½" (480 VAC example).

**FEATURE:** Heavy Duty capacitors are polypropylene type, three phase with discharge resistors and overpressure safety device.

**Function:** Capacitors can operate in more stringent conditions effectively with the dense resin encapsulation, self-healing, metallized film, which provides for a dry (no free liquid) system. Capacitors accommodate up to a 10% THD environment and have a five year warranty.

**FEATURE:** Contactors are high duty, designed for capacitor switching and include damping resistors.

**Function:** Specifically designed for high on/off operation, helps reduce high currents from back-to-back switching of capacitors and extends life.

**FEATURE:** Contactors are same size for all part numbers with "like steps."

**Function:** Assures best switching values; spare parts are more uniform, easier to obtain.

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Controller Front Panel

Heavy Duty Capacitors



**FEATURE:** Fuses are rated for 200 kaic, 700 VAC, high overload capability design, reacts quickly to short-circuit conditions; fuse ampere sizes are the same for “like” kVAR steps.

**Function:** Maximum equipment protection; spare parts are more uniform, easier to obtain.

**FEATURE:** Fuses include individual blown fuse indication, plus available indication lights (each phase) on enclosure front door.

**Function:** Helps to quickly identify and replace specific fuse.

**FEATURE:** Location of relays and CPT (CPT has primary and secondary fuses).

**Function:** Allows for internal control devices to operate and be functionally tested at the factory; ease of serviceability; additional personnel safety.

**FEATURE:** Standard 12-step StacoVAR Intelligent Power Factor Controller has a front panel display with multiple programmable functions and alarm.

**Function:** Provides for accurate regulation and control of needed kVAR; all information is contained in one location; easy to use.

**FEATURE:** PF controller is automatically disabled when system overvoltage condition exists.

**Function:** Additional personnel safety.

**FEATURE:** Removable lifting eyes (top) included with enclosure.

**Function:** Makes handling/installation simpler.

**FEATURE:** Optional molded case circuit breaker (C/B), CT (split-core type, multi-tap), and TVSS.

**Function:** Breaker allows for a disconnection means at the equipment location, and includes integral plexiglass safety cover. CT is not required to be purchased from a second source, and allows for a “one size fits all.” TVSS enhances equipment protection from surges.

**FEATURE:** Other power factor and harmonic correction technologies available.

**Function:** Certain requirements or more complicated applications can be met with the use of thyristor switching, dynamic compensation/real time power factor correction, or by employing active (power electronic) harmonic filters.

### Automatic Power Factor Correction (De-Tuned) with Reactors

*(All the features listed above, plus the following)*

**FEATURE:** Tray design includes a barrier between capacitors and reactors.

**Function:** Reduces heating between components; helps improve expected life.

**FEATURE:** Enclosure includes fan package.

**Function:** Forced air cooling improves movement of ambient air, helping to cool components.

**FEATURE:** Three phase iron core reactors, copper wound, UL recognized, designed for 3.78 (well under the 5<sup>th</sup> order at 227Hz).

**Function:** Built for long life, sized to accommodate higher than normal currents to protect capacitors while providing mitigation.

**FEATURE:** Iron core reactors include a thermal switch.

**Function:** Provides automatic shut-down when reactor overheats to maintain the integrity of components while still allowing the system to partially operate.

**FEATURE:** Heavy duty capacitors used with reactors are rated for 690 VAC (480 VAC system), 480 VAC (240 VAC system).

**Function:** Harmonic environments generally produce high currents, which may damage or reduce the life of the capacitor. 690 VAC rated capacitors help mitigate these concerns with a higher level of performance.

# StacoVAR®

## About Staco Energy Products Company

Since 1937, customers worldwide have been relying on Staco Energy Products Company to deliver voltage control and power quality solutions tailored to their needs.

As a leading power quality resource, we offer our customers world-class support; from our thorough applications assessment, to our ability to design and deliver a solution that is tailored to the specific needs of our customers; through delivery and commissioning.

Our professional, factory trained service team is in place to ensure that our customers' revenues are protected, and their investment provides them with many years of trouble free operation.

Staco develops total power solutions for OEM and end user applications.

*In addition to StacoVAR we offer a wide array of power quality products, including:*

- **Uninterruptible Power Supplies**
- **Power Conditioners**
- **Voltage Regulators**
- **Power Factor Correction and Harmonic Mitigation**
- **Active Harmonic Filters**
- **Variable Transformers**
- **Custom Engineered Test Sets**



**Represented locally by:**



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